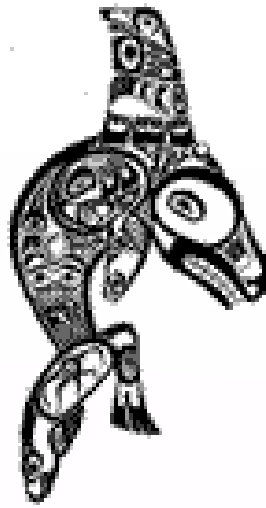


Enhanced hypoxia tolerance of triploid rainbow trout.

Christine Verhille, Katja Antilla, Lubna Lutfi, Tony Farrell



3N into ~ 50% of BC lakes

Why?

Sterile

Predicted increase growth and survival



In reality:
Sterile
Reduced growth & survival
Wimps



**Why poor 3N performance?
What to do about it?**

Cardiovascular system

Reduced:

- **Aerobic scope**
- **O₂ pick up at gills**
- **Tolerance to low O₂**
- **Tolerance to high temp.**

2 Experiments

1. Hypoxia



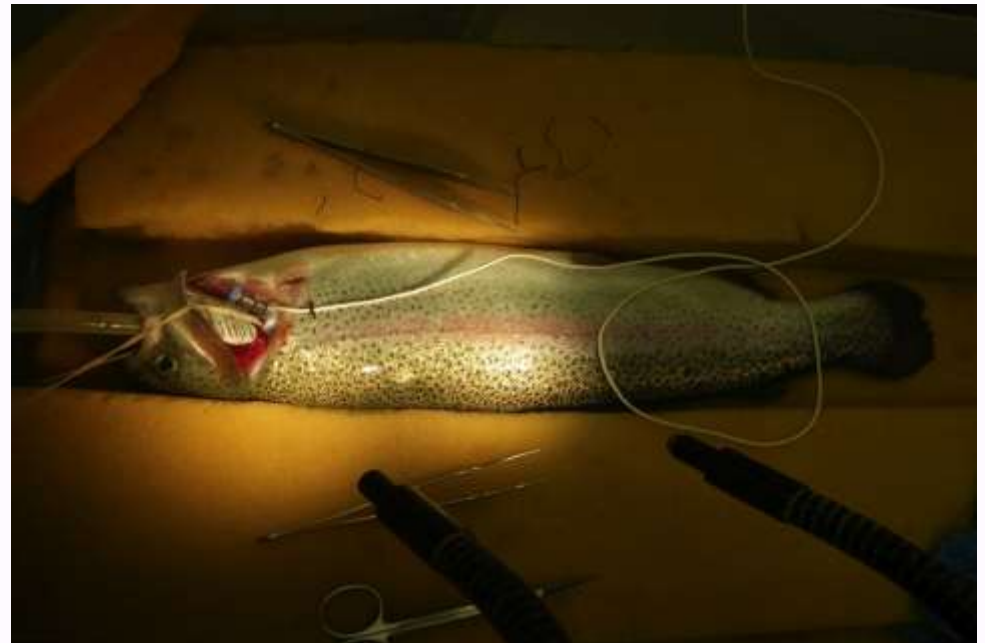
2. Temperature

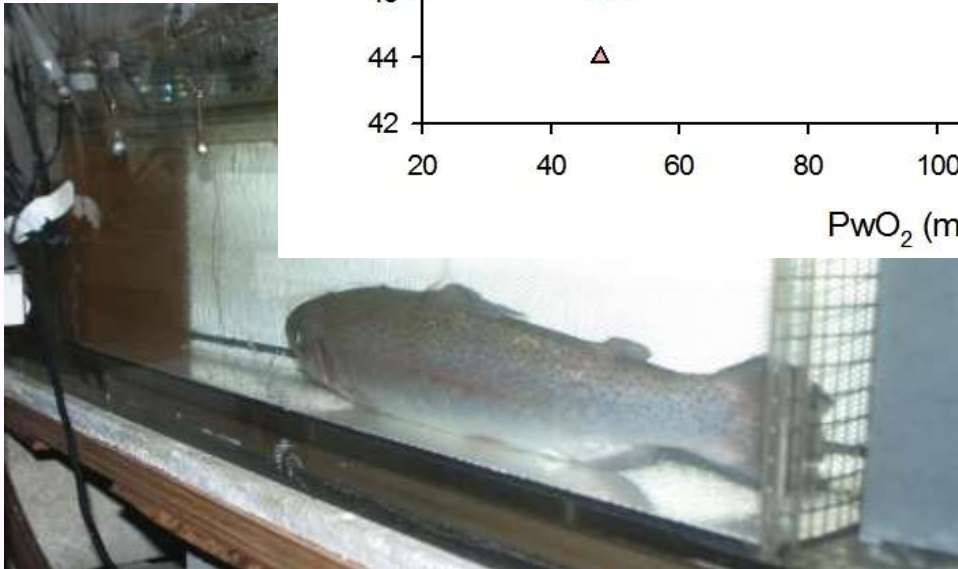
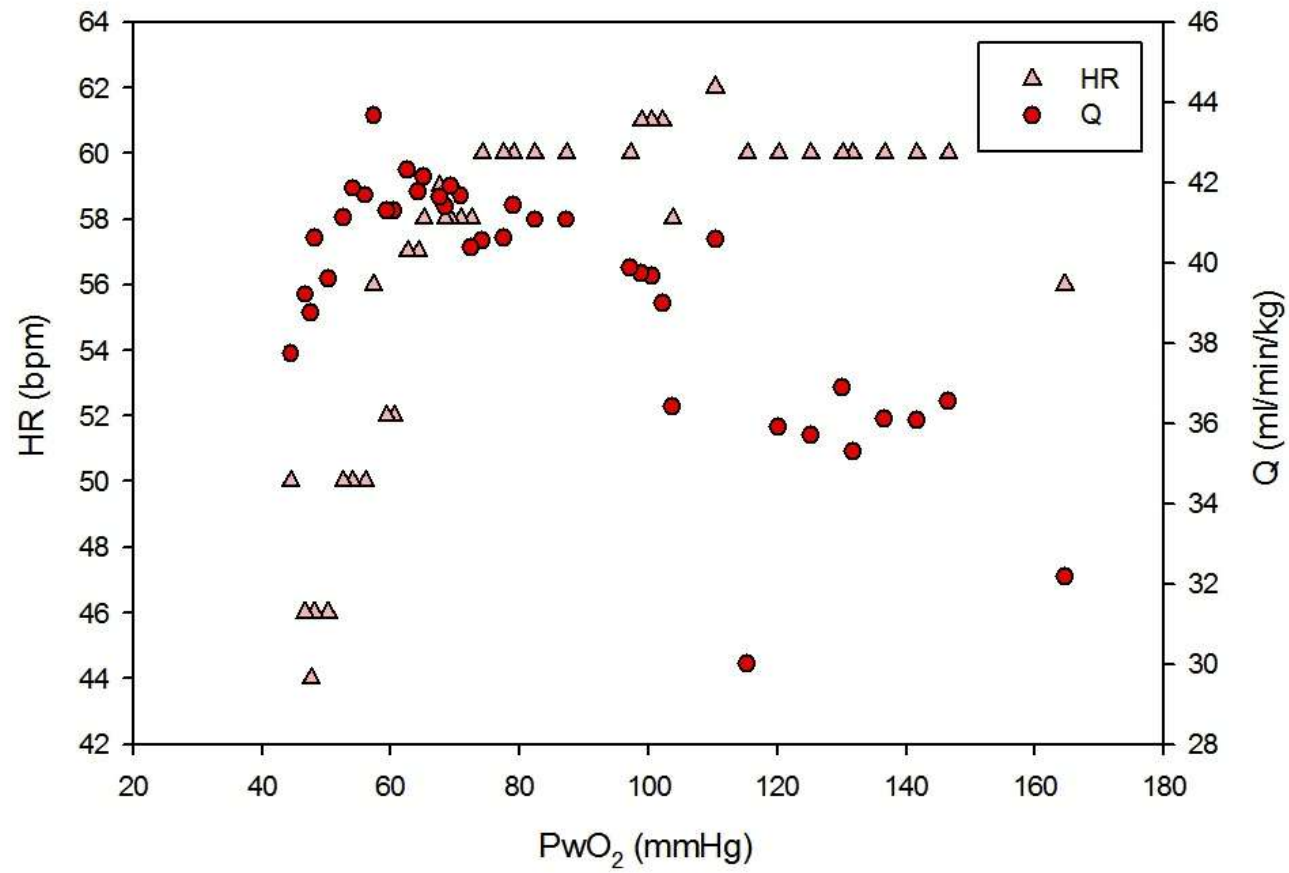
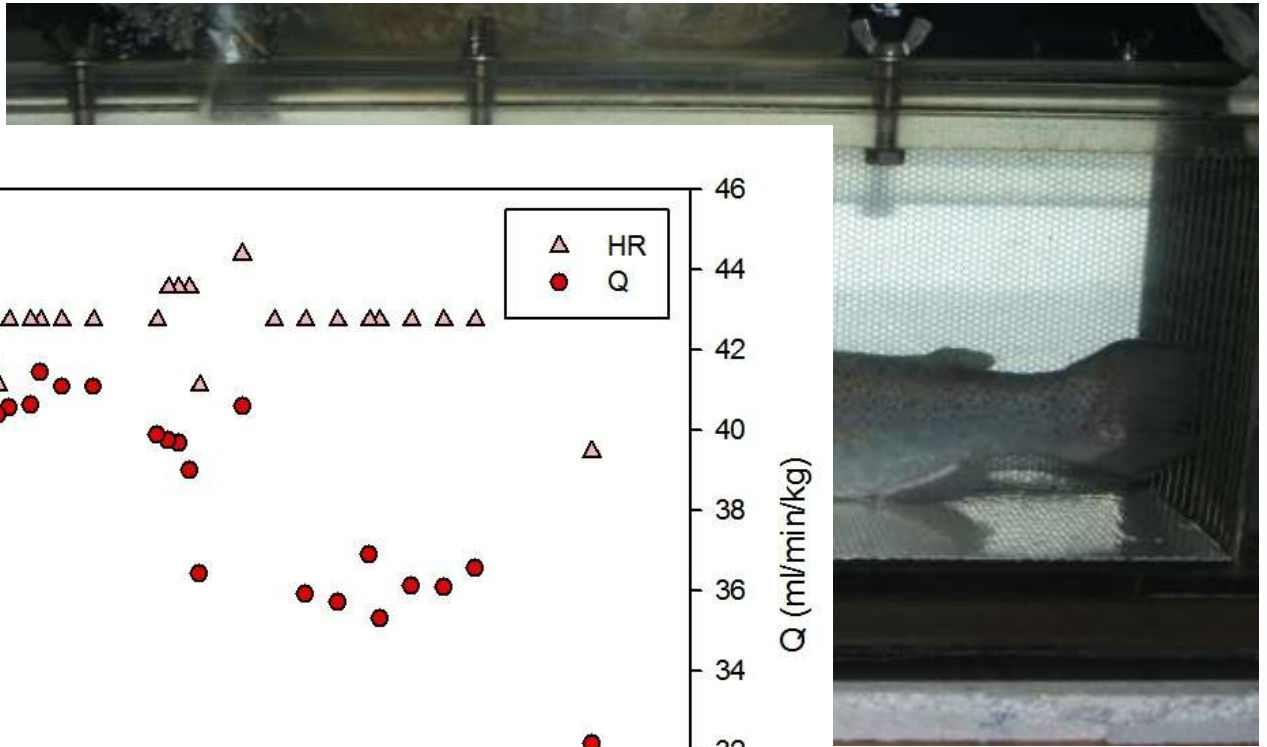


Hypoxia

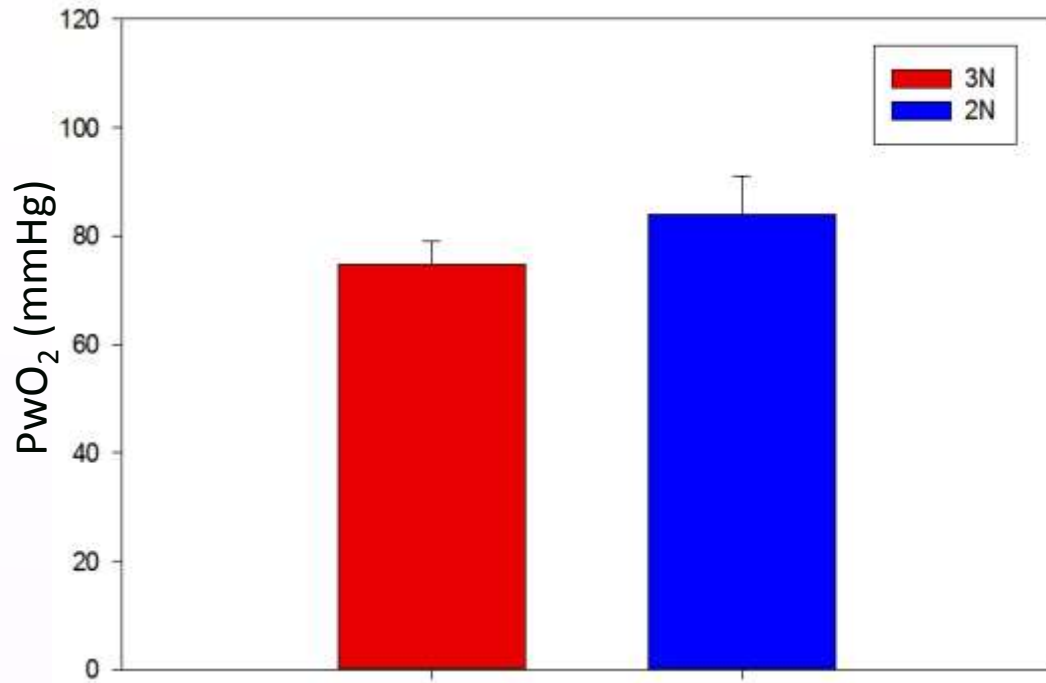
Cardiovascular system as hypoxic

- Cardiac output = $HR \times SV$
- Blood O_2 , but not today.

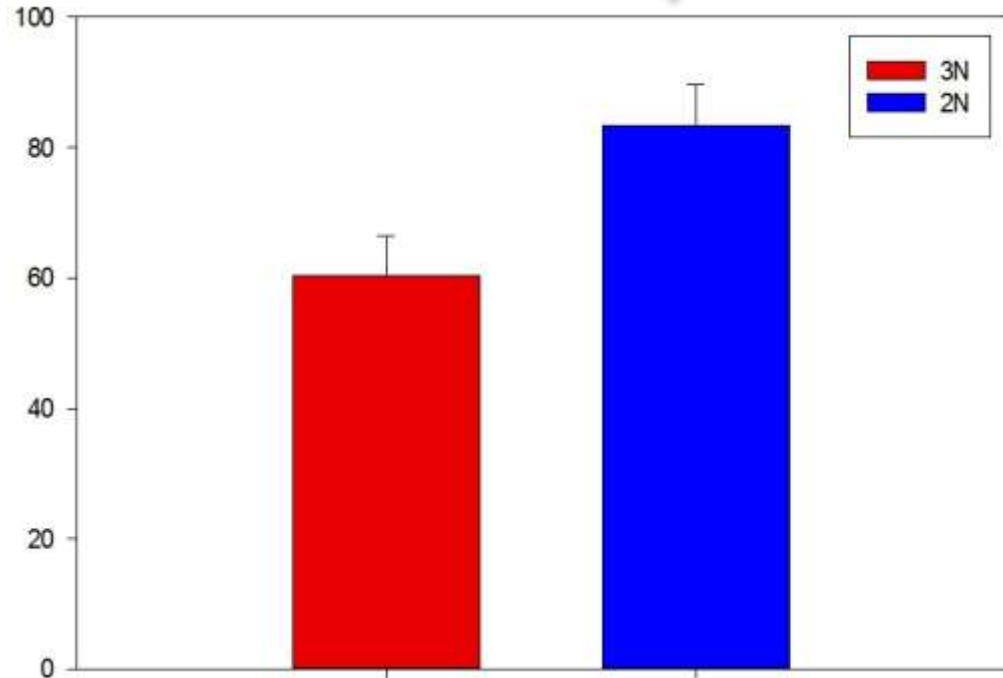




Pcrit HR



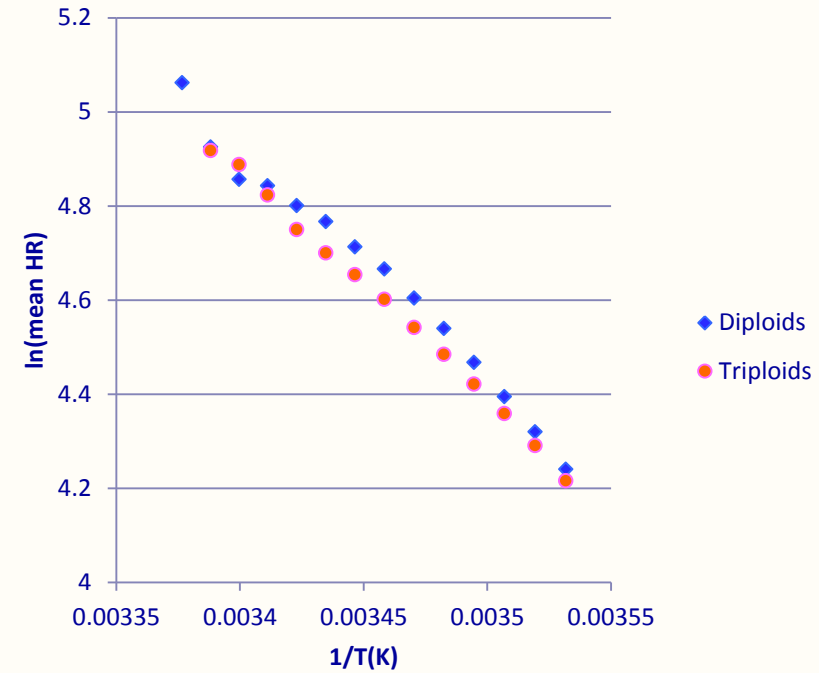
Pcrit Q↓



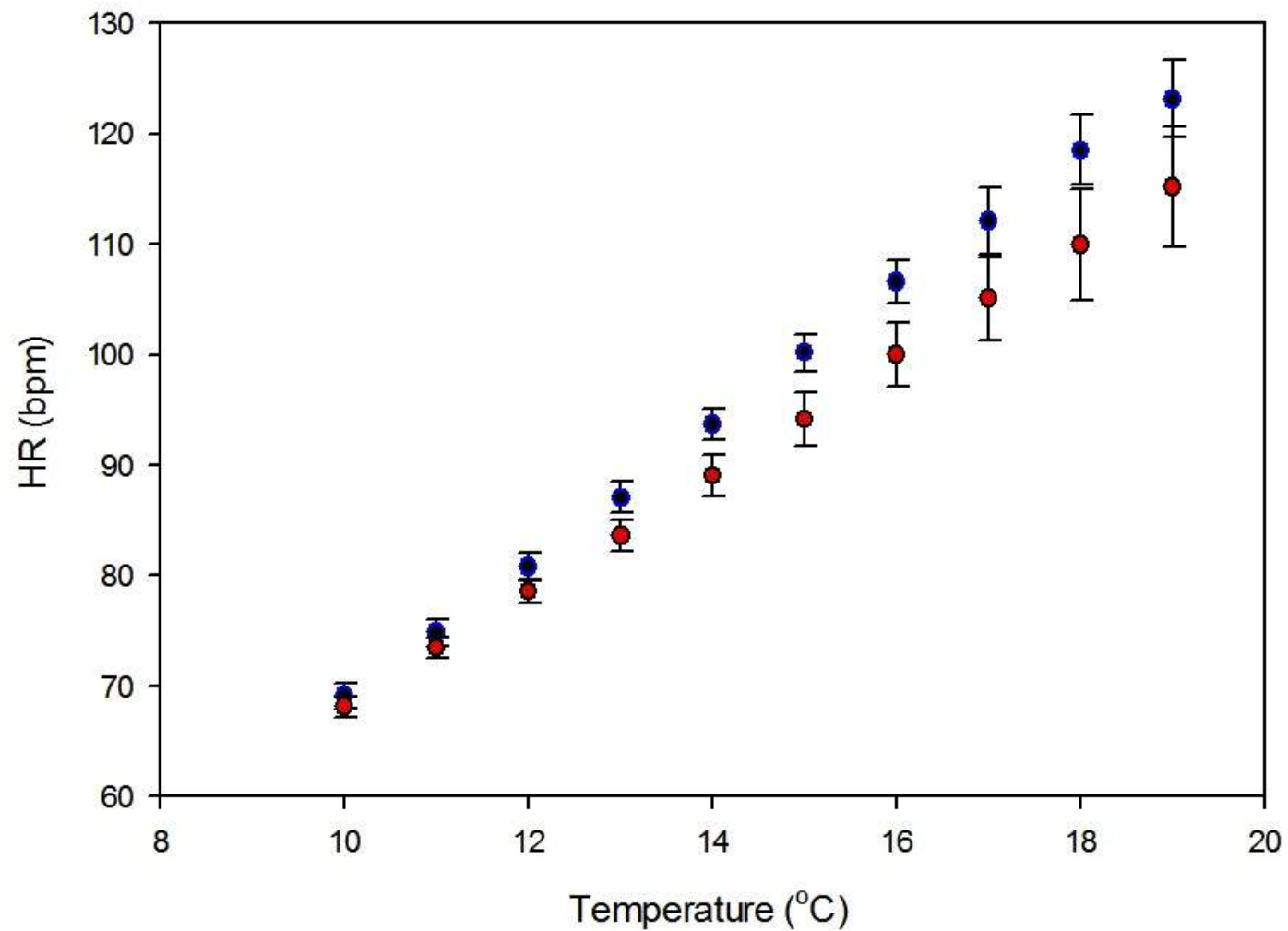
3N MORE tolerant of low oxygen??

Temperature

- **Noninvasive**
- **EKG**
- **MS222**
- **Atropine - nerve**
- **Isoproterenol – hormonal**
- **Breaking point**
Arrhenius
- **Arrhythmia**

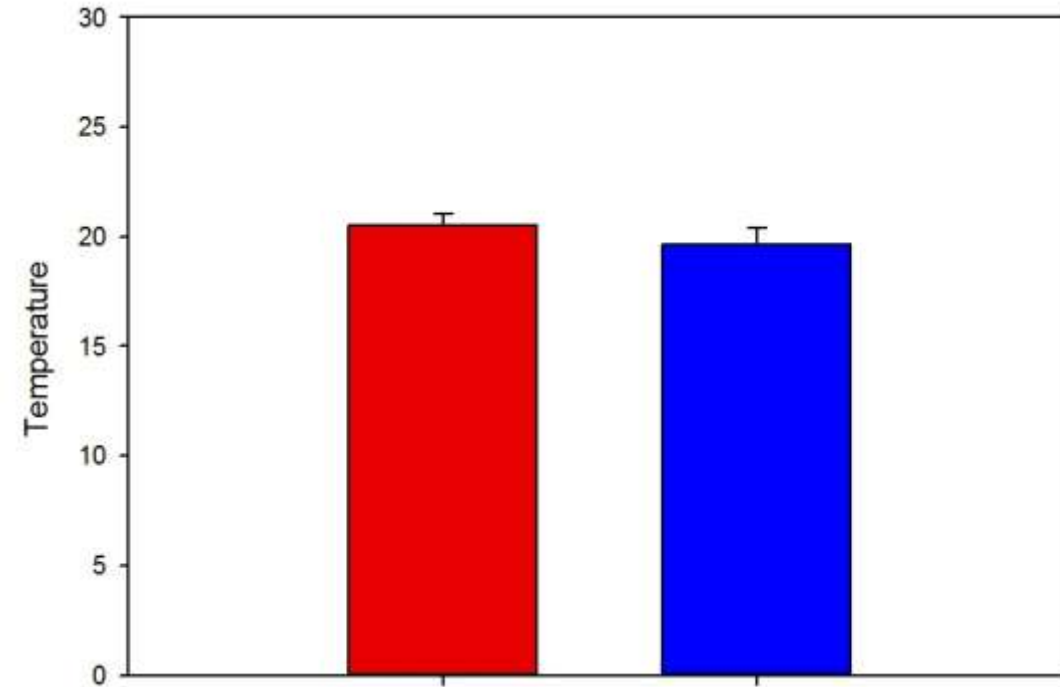




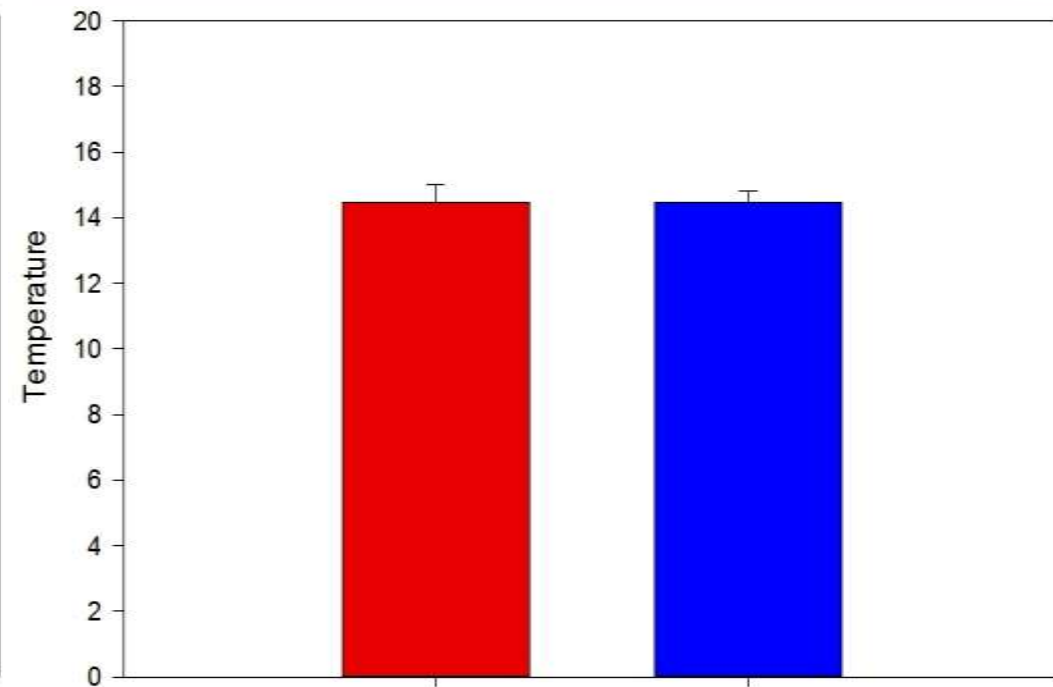


$$Q = HR \times SV$$

T_{crit} Arrhythmia



T_{crit} Breaking Point



- 3N lower HR – SV?
- Similar T_{crit}

Conclusions



HYPOXIA:

3N lower Pcrit??

TEMPERATURE:

**3N lower HR – SV??
Similar Tcrit**

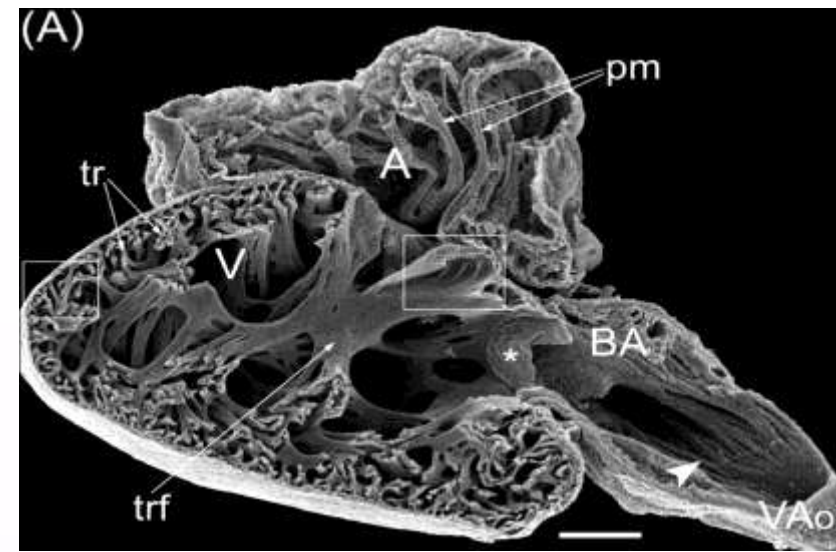
Why SV?

$$Q = HR * SV$$

No oxygen when heart beat

Thinner heart when full

Training?



Thank You



FFSBC

Adrian Clarke

Theresa Godin

Sarah Northrup

Steve Arnold

Charlotte Rosineau

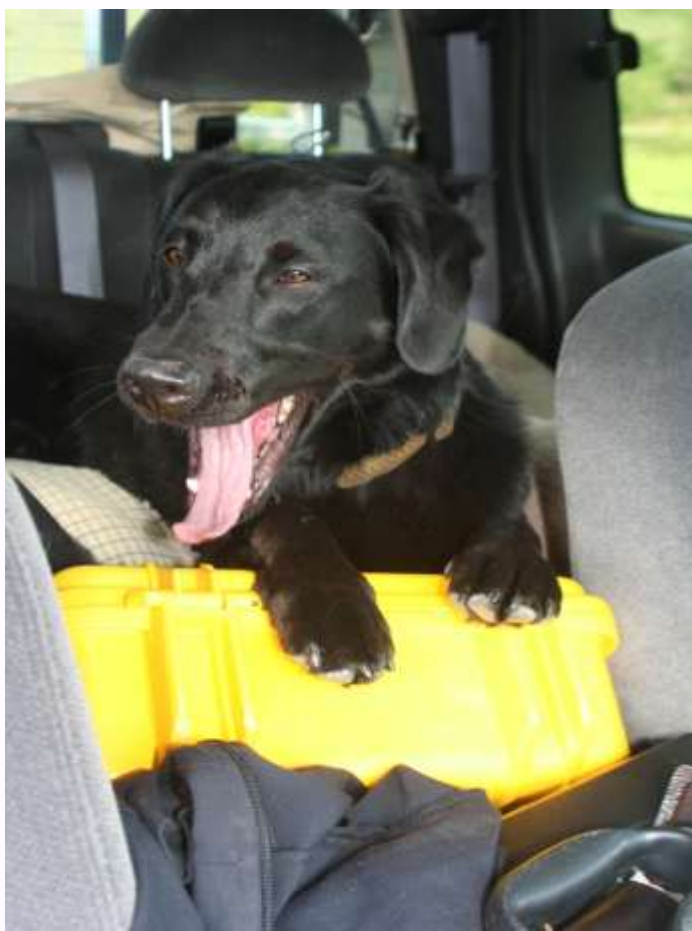
FVTH people

Farrell lab

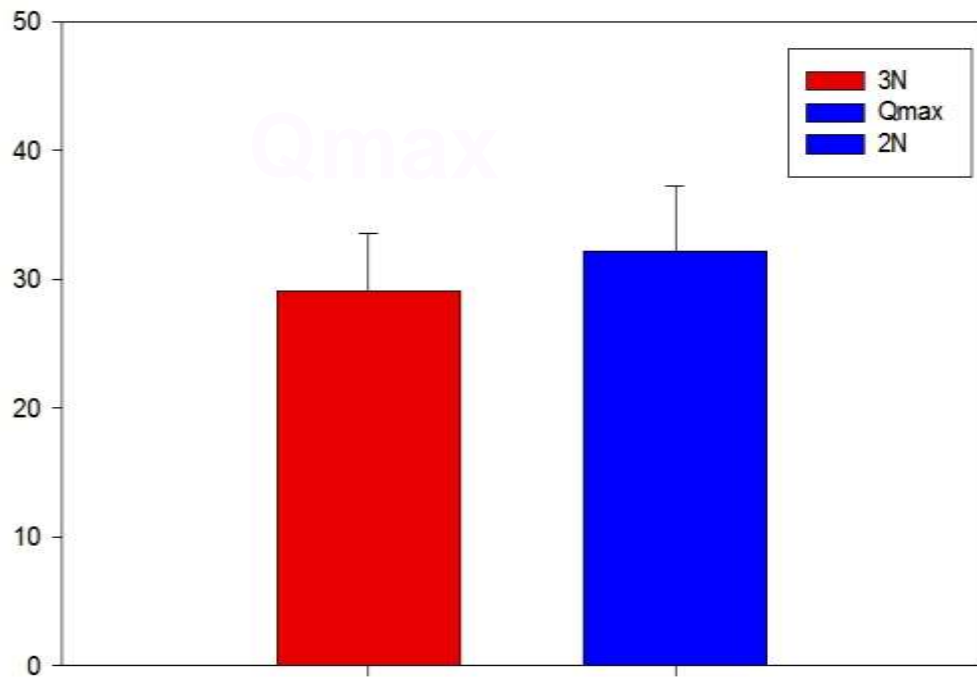
UBC graduate students

Mark Scott

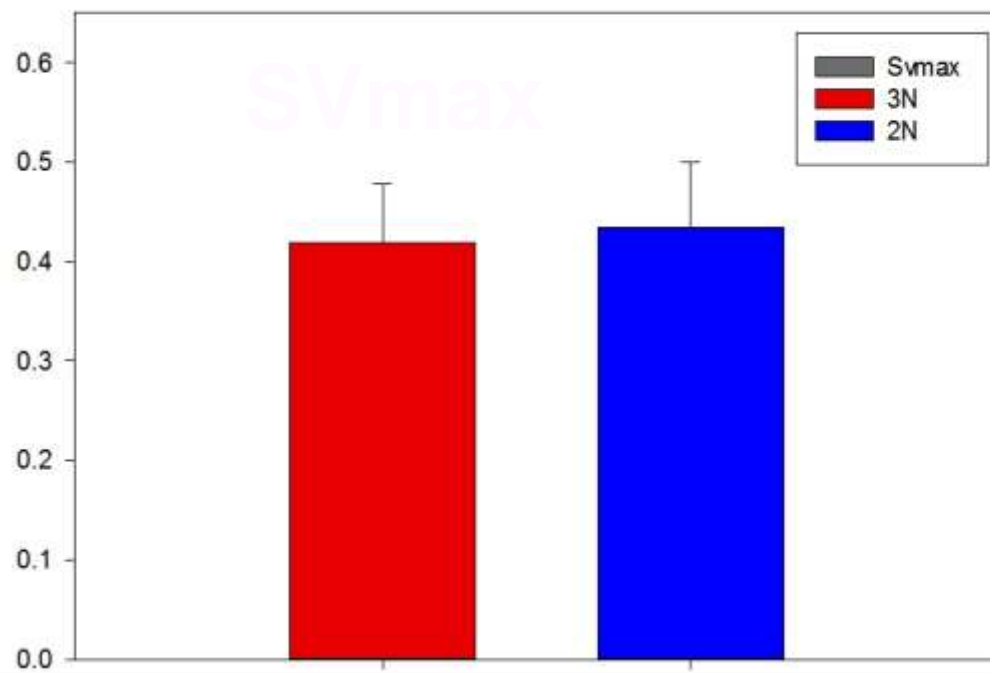
Andrew Thompson



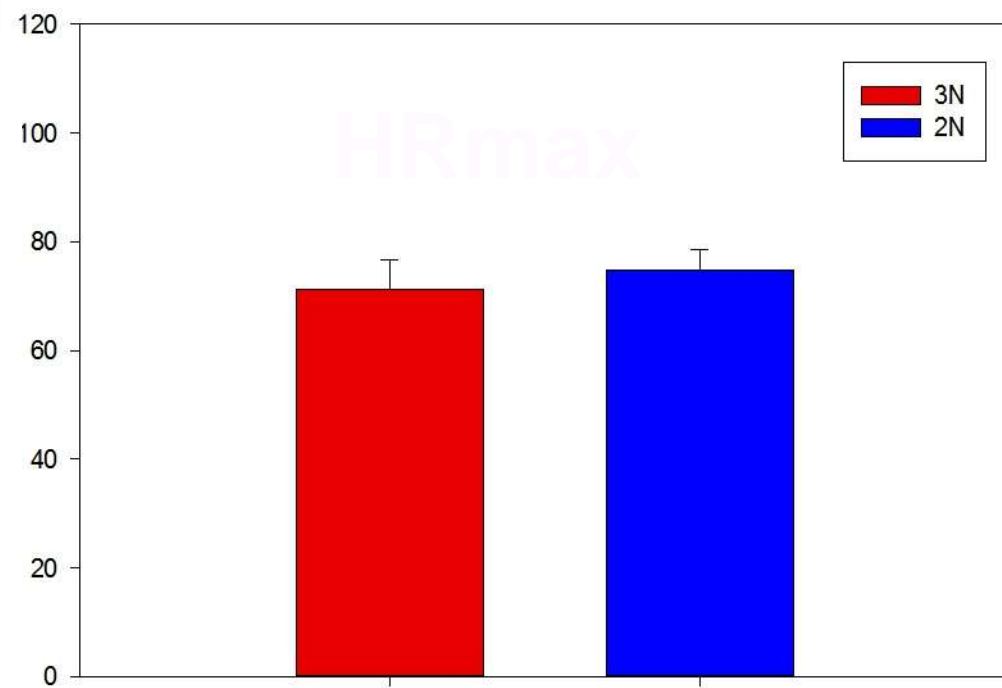
Qmax



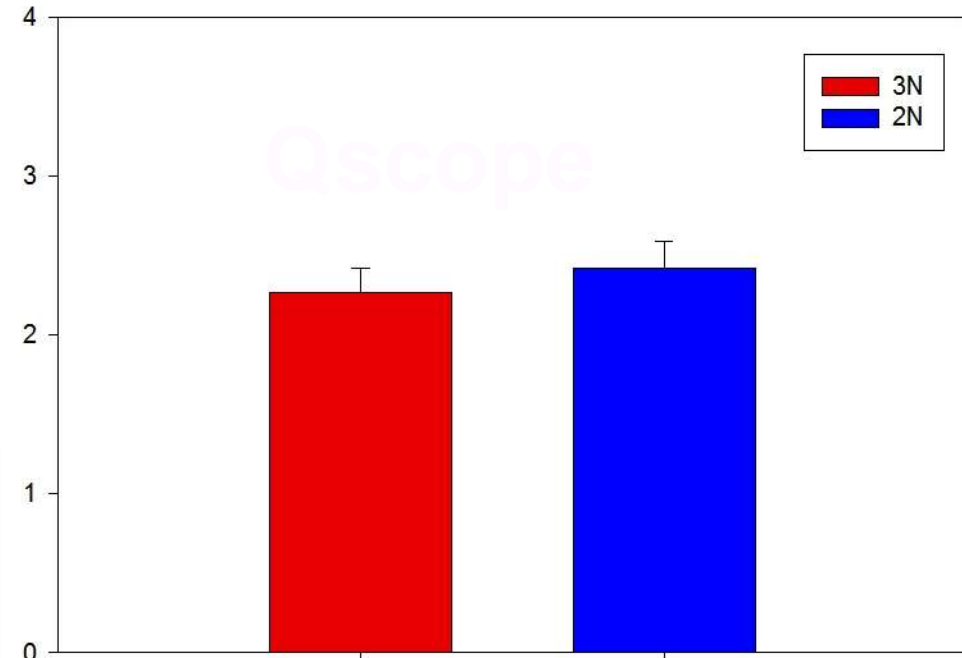
SVmax



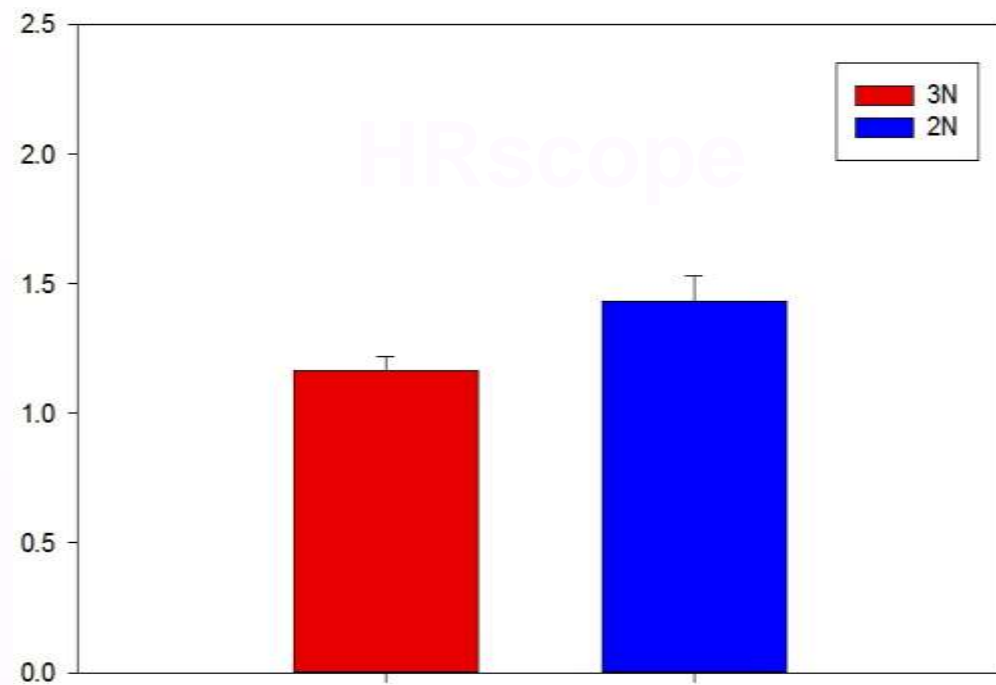
HRmax



Qscope



HRscope



SVscope

